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Item 5 (a) of the provisional agenda

METHODOLOGICAL ISSUES

LAND-USE, LAND-USE CHANGE AND FORESTRY (DECISION 1/CP.3, PARAGRAPH 5 (a))

Report on the second SBSTA workshop on land-use, land-use change and forestry

Note by the secretariat

I. MANDATE

1. The Subsidiary Body for Scientific and Technological Advice (SBSTA), at its ninth session, requested the secretariat to organize a second workshop related to land-use, land-use change and forestry (LULUCF) with the participation of experts, including those engaged in the Intergovernmental Panel on Climate Change (IPCC) process. The purpose of the workshop would be to focus on issues related to Article 3.4 of the Kyoto Protocol, such as methodologies, uncertainties, research and data needs, issues identified in document FCCC/SBSTA/1998/INF.1, and issues derived from submissions by Parties, and to further elaborate on issues arising from the first SBSTA workshop on LULUCF, which was held on 24 and 25 September 1998 in Rome (FCCC/SBSTA/1998/9, para. 34 (c)).

2. It further requested the secretariat to report on the second workshop to the SBSTA at its tenth session.

II. SCOPE

3. In preparing the workshop, account was taken of submissions from Parties,[1] the work of the IPCC in progress on technical and scientific matters associated with Article 3.3 and 3.4 of the Kyoto Protocol, and the agenda of the tenth session of the SBSTA on matters related to those paragraphs of Article 3. Consequently, the workshop focused on:

(a) The status of the IPCC Special Report on LULUCF;

(b) The exchange of information and ideas amongst Parties on methodologies, uncertainties, and research and data needs, and;

(c) Consideration of how scientific and technical information on methodologies, uncertainties, and research and data needs, should be provided to the SBSTA to facilitate discussion on possible additional activities under Article 3.4 of the Kyoto Protocol.

4. Due to the limited time between the workshop and the deadline for the workshop report, annexes I, II and III have not been edited by the secretariat.

III. REPORT ON THE WORKSHOP

5. The workshop was attended by 78 experts nominated by Parties (23 non-Annex I and 55 Annex I Parties), 15 representatives of the environmental, business and industry, and municipalities and local authorities constituencies, 4 expert speakers, and 19 lead authors and coordinating lead authors of the IPCC Special Report on LULUCF.

6. The workshop was co-chaired by Mr. Paul Maclons (South Africa) and Mr. Maciej Sadowski (Poland), who welcomed the participants. Mr. James Lyons, Under Secretary of the United States Department of Agriculture (USDA), welcomed the participants on behalf of the Government of the United States. Mr. Dennis Tirpak, Deputy Coordinator, UNFCCC secretariat, gave an overview of the issue within the Convention/intergovernmental process and possible decision-making in this regard (see FCCC/SBSTA/1999/5).

7. Dr. Robert Watson, Chairman of the IPCC, gave a progress report on the IPCC Special Report on LULUCF. The coordinating lead authors of the Special Report provided details on chapters two to seven, followed by question-and-answer sessions. The presentations focused on the process by which the chapters are being put together, the structure of the chapters, the scope and the key issues. Summaries of these presentations are contained in annex I.

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[1] Submissions regarding issues to be considered at the second SBSTA workshop, together with submissions on the first sentence of Article 3.4 of the Kyoto Protocol, and on policy and procedural issues associated with Article 3.3 and 3.4 of the Kyoto Protocol, are contained in document FCCC/SBSTA/1999/MISC.2 and its addendum.

8. Fourteen experts nominated by Parties[2] made presentations on topics such as methodological issues associated with additional activities under Article 3.4 of the Kyoto Protocol, including: carbon contents and fluxes in agricultural soils, experience with inventories of forests and other woody biomass, sustainable land and forest management, restoration of degraded land, and measurement uncertainties. Summaries of these presentations are contained in annex II.

9. After these presentations the group split into breakout groups dealing with issues associated with the agricultural sector (approximately 25 participants) and the forestry sector (approximately 75 participants).[3] Presentations were made by four experts focusing on some aspects of methodological issues, uncertainties, and research and data needs, for different activities which may be considered under Article 3.4. of the Kyoto Protocol. After these presentations the workshop participants considered a common question using a "case study" approach. The question posed was: How should scientific and technical information on methodologies, uncertainties, research and data needs, be provided to the SBSTA to facilitate consideration of possible additional activities under Article 3.4 of the Kyoto Protocol?

10. The breakout groups were requested to prepare a simple, short but comprehensive report and to provide the information to the plenary on the last morning of the workshop. A synthesis of these reports is contained in the next section, whilst the full reports of the breakout groups are contained in annex III.

11. The co-chairmen noted that some of the provisions of Article 3.3 and 3.4 of the Kyoto Protocol are unclear and need further discussion, and that even after the completion of the IPCC Special Report, some gaps in our understanding may remain. This will need to be overcome before this article of the Kyoto Protocol can be implemented smoothly and with confidence. They also encouraged Parties to continue to develop and implement national systems for the estimation of carbon stocks and changes to those stocks.

12. The co-chairmen closed the workshop with a special word of thanks to the Governments of Japan and the United States of America for their financial assistance to the workshop, particularly to the United States Department of Agriculture for helping with logistical arrangements for the workshop. In addition, they expressed appreciation to Dr. Robert Watson, the lead authors and the coordinating lead authors of the Special Report who made presentations.

13. Following the workshop, the United States Department of Agriculture organized a field trip to a farm site where low tillage agricultural practices have been used for approximately 20 years. The field trip also included a visit to an experimental forest site where measurements are

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[2] Presentations were made by experts nominated by the following Parties: Argentina, Australia, Austria, Canada, Estonia, Finland, Iceland, Italy, Japan, Norway, Slovenia, Sweden, Switzerland, and the United States of America.

[3] The coordinating lead authors and lead authors of the IPCC Special Report could not participate in these breakout groups as they had to attend a lead authors' meeting.

being made of carbon dioxide, other gases, and forest biomass, in order to estimate the amoun carbon being stored in, and released from forest.

IV. SYNTHESIS OF SUBGROUP REPORTS TO THE PLENARY

14. The reports of the breakout groups revealed a number of common issues, suggesting a consensus on their importance. These include tentative *conclusions* as follows:

(a) It would be useful if the IPCC could use a unified format for the presentation o information on the activities/categories that are to be discussed in the Special Report on LULUCF. A suggestion was made that the exact format could be developed in consultation w the secretariat;

(b) Additional activities under Article 3.4 should be in conformity with other conventions such as the Convention to Combat Desertification, the Convention on Biological Diversity, and the Forest Principles contained in Agenda 21, and;

(c) Reporting on Article 3.3 and 3.4 activities during the first commitment period should include both the emissions from, and the removal by, those activities. In addition, Part should work towards comprehensive reporting on all activities/categories during the second commitment period, possibly before.

15. In addition, other *questions* were identified that could be addressed by the IPCC and/o Parties. These were:

(a) What are the implication of defining activities/categories broadly or narrowly? For example, would defining activities/categories narrowly lead to a "lock-in" of technology?

(b) What are the implications of approving additional activities under Article 3.4 o the Kyoto Protocol for the targets of all Parties to the Protocol in the first and subsequent commitment periods?

(c) What information should be provided on the models that are used by Parties to quantify carbon stocks and changes to those stocks? How can these models be evaluated?

(d) Should guidance on "best practices" for the purpose of developing monitoring systems be provided? If so, how and when should this guidance be developed?

16. In addition, the breakout groups made *suggestions* as to what the SBSTA might wish t consider during its tenth session, for example:

(a) Request the IPCC to present more detailed information on each chapter to raise awareness of the type and level of information that is likely to be forthcoming in the Special Report on LULUCF;

(b) Further discuss the treatment of wood products in national accounting systems in the light of the approaches evaluated by the IPCC;[4]

(c) Discuss criteria for selecting additional activities under Article 3.4 of the Kyoto Protocol;

(d) Consider a process for further decision-making on issues related to LULUCF.

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[4] IPCC/OECD/IEA Programme on National Greenhouse Gas Inventories: "Evaluating Approaches for Estimating Net Emissions of Carbon Dioxide from Forest Harvesting and Wood Products" by Sandra Brown, Bo Lim, and Bernhard Schlamadinger. Meeting report, Dakar, Senegal, 5-7 May 1998.

Annex I[1]

SUMMARY OF PRESENTATIONS ON THE IPCC SPECIAL REPORT ON LAND-USE, LAND-USE CHANGE AND FORESTRY

The IPCC Special Report on Land-Use, Land-Use Change and Forestry (SR-LUCF) examines carbon stocks and flows in terrestrial ecosystems in the agricultural and forestry sectors. It addresses scientific and technical issues, and other matters of importance for implementing the Framework Convention on Climate Change and the Kyoto Protocol, that are designed to stabilize atmospheric concentrations of greenhouse gases. The final report will be policy relevant, yet policy neutral with the understanding that sovereign nations will determine how best to implement carbon sequestration programs.

At the Subsidiary Body for Scientific and Technological Advice workshop in Indianapolis, key issues were discussed by the workshop participants such as: uncertainties, methodologies, and research and data needs in relation to carbon sequestration, carbon accounting, definitions, verifiability, and the permanence of carbon sinks. The Special Report addresses each of these concerns, as well as others, such as socio-economic and additional environmental impacts of different activities that can be undertaken in the agricultural and forestry sector. This report may serve as a guidebook of the tools available for assessing and monitoring carbon stocks and flows in these sectors.

Chapter 2:

Chapter 2 of the report describes carbon system dynamics in relation to the transfer of carbon from the atmospheric to the terrestrial reservoir of above-ground biomass and soils and vice versa. This chapter provides the background to the report dealing with key considerations in this area such as: what are the daily, seasonal, and annual variations in global carbon stocks and flows? How have these changed in the last 20 years as evidenced by a new assessment for the decade 1988-1998? What are the long-term natural and anthropogenic trends in atmospheric and terrestrial carbon pools?

Chapter 3:

Chapter 3 of the SR-LUCF is the "definitions chapter", recognizing appropriate definitions as the basis for viable carbon sequestration strategies. The chapter outlines the principles and criteria employed to suggest definitional scenarios that are sufficiently flexible to fit a variety of real-world situations. The chapter also reviews existing definitions and their adequacy for these purposes.

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[1] The information in this annex was provided by the IPCC. The text has not been edited by the secretariat.

The chapter reviews the selected definitional scenarios and the application of language specific to the Kyoto Protocol, such as: human-induced, direct, activities, projects, and project activities, resulting from, related to, since 1990, changes in carbon stocks in each commitment period, verifiable and transparent. It also reviews the linkages and interaction between definitions, addresses leakage and issues such as carbon accounting and appropriate levels of accounting and reporting. The chapter also includes a review of methods for the measurement of stocks, fluxes, and harvested wood products.

Chapter 4:

Chapter 4 focuses on Article 3.3 of the Protocol. It builds upon the foundation of definitions developed in the previous chapter to quantify changes in carbon stocks resulting from afforestation, reforestation, and deforestation (ARD) activities. A critical issue is the choice of definitions that determine the extent of land that is included in the accounting system. Detailed scenarios for each of the ARD activities are developed for forestry that evaluate the magnitude and timing of changes in carbon pools. This chapter also contains a detailed discussion of the trade-offs and uncertainties, in terms of carbon, between intended outcomes and simplicity of accounting.

The chapter continues to assess the definitional scenarios and their impact on reported carbon stock changes (as compared to the real carbon stock changes) for hypothetical ARD case studies on the stand and landscape levels. It summarizes published country studies to demonstrate the range of carbon implications for various scenarios, and assesses the magnitude of carbon credits or debits ARD activities might create at the global scale. Finally, the chapter identifies, for each definitional scenario, the interactions of increased ARD activities with biodiversity, water cycle, socio-economic, and other considerations.

Chapter 5:

Chapter 5 focuses on scientific and technical information related to the most widely-discussed "additional activities" that will be considered as the Conference of the Parties (COP) makes its decisions on activities that can be included under Article 3.4. Such practices are presented with regards to the process and timescale of carbon changes.

Some of the important issues to be addressed include the definitional and boundary questions: where does one land use end and the adjoining one begin? How readily can those questions be answered using existing scientific and technical methods? If the final COP decision is to include a partial list of land use, land-use change, and forestry activities, those definitions become critical, because each definition will mean that millions of hectares may be defined in or out of the party's carbon accounting system. A full accounting system, on the other hand, makes definitions far less critical because all lands will be in one category or another, and all will be reported. This will, however, create the need for a broader inventory and data system, which may create challenges for the Parties.

In addition, the chapter will examine issues such as transparency, verifiability and uncertainties, and how those will be affected by various options for including "additional activities", and the consideration of the uncertainties for evaluating carbon sequestration in carbon pools susceptible to disruption by natural and anthropogenic forces and events.

Chapter 6:

Chapter 6 addresses project based activities that include one or more mitigation activities within a specific geographic location, time and institutional frame at a sub-national level. In this chapter, timing and time preferences associated with their greenhouse gas (GHG) mitigation, and permanence, risks, additionality, accounting and leakage of GHG benefits are examined. Furthermore, three alternative approaches to account for GHG flows, in order to address the permanence issue are presented. Establishing without-project baselines and additionality of GHG flows is the most challenging issue facing projects. In that context approaches such as modeling and trend analysis are discussed.

Most nations employ techniques and methods for measuring carbon pools in land-use, land-use change and forestry projects that are based on accepted principles of forest inventory, ecological surveys, and soil science. This chapter considers these factors and suggest how standard criteria might be used to quantify and verify carbon sequestration. This last point underscores the importance of technology transfer and human and institutional capacity-building to improve national capabilities for carbon sequestration project design and implementation.

Chapter 7:

The Special Report concludes with a discussion of adequacy of the Revised 1996 IPCC Guidelines for operationalizing the Kyoto Protocol. These guidelines represent the current state of international consensus on methods for reporting the impacts of greenhouse gas emissions and removals. There are several aspects of the guidelines, however, that do not specifically address the issues surrounding changes in carbon stock. Consequently, chapter 7 will assess discrepancies between current guidelines and provisions required under Article 3 of the Kyoto Protocol and provide suggestions for relevant guidelines to account for changes of carbon stock both at the project and national level. These suggestions will highlight the issues to be considered in such reporting guidelines.

Annex II[1]

SUMMARIES OF PRESENTATIONS BY PARTIES

Name of Presenter : Mr. Daniel Maradei (Argentina)

Title of Presentation : Why forestry in Argentina?

Summary of Presentation :

There is an outstanding potential for investments in the Argentine forestry sector, based on:

1. Availability of large land areas with high production potential with private ownership rights.
2. Very competitive land cost, when compared to land costs of neighbouring countries.
3. Relatively low plantation establishment costs.
4. Availability of a highly qualified labour force.
5. Climate diversity that allows growth of a wide variety of species.
6. Absence of economically important insect or disease problems
7. High growth rates which allow for greater wood production with shorter rotations (5 to 7 years for eucalypts and 16 to 22 years for pines).
8. Promotional measures offered by Federal and Provincial Governments.
9. Economic deregulation and fiscal stability.
10. Very attractive returns on investments.

Finally, Argentina has some clear advantages for obtaining Clean Development Mechanisms (CDM) investments in Land-Use Change and Forestry (LUCF) projects.

An essential thing to be considered -even though the CDM does not explicitly refer to the improvement of sinks- is that LUCF unquestionably results in emission reductions. LUCF has a very important advantage over the energy sector, which is that while changes in energy can only result in a reduction of emissions, LUCF can reduce emissions through improved management and increase natural carbon sequestration in sinks.

Options for emissions reduction in LUCF include avoiding deforestation, preventing forest fires, using residues for production method efficiency, improving forest management, using low impact shoring up techniques, etc.

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[1] The information in this annex was provided by the presenters. The text has not been edited by the secretariat.

Name of Presenter : Mr. Ian Carruthers (Australia)

Title of Presentation : Additional activities under Article 3.4

Summary of Presentation :

Land based activities are a major feature in Australia's greenhouse profile.

Additional activities under Article 3.4 present opportunities to move to a more comprehensive greenhouse response by including land based activities which simultaneously provide important sustainable development benefits.

Australia has a comprehensive response strategy, the National Greenhouse Strategy. A National Carbon Accounting System is under development to provide a comprehensive framework for measurement monitoring and verification.

Many potential sustainable land management which have greenhouse benefits, for example use of saltbush and oil-mallee plantings in areas of dryland salinity and improved grazing management practices in Australia's extensive rangelands, lie outside the scope of afforestation and reforestation under Article 3.3 of the Protocol.

Name of Presenter : Mr. Klaus Radunsky (Austria)

Title of Presentation : First estimation of sinks according to Article 3.3 of the Kyoto Protocol and recalculation of sector "changes in forest and other woody biomass stocks".

Summary of Presentation :

Austrian forest inventory is an adequate basis to estimate sinks according to Article 3.3. This Kyoto forest has been calculated to be a net source until 2020 and only becomes a sinks afterwards. A recalculation of the sector "changes in forest and other woody biomass stocks" shows that extrapolation of data of previous forest inventory resulted in an over estimation of th Austrian forest of about 100%.

Name of Presenter : Dr. C. Wayne Lindwall (Canada)

Title of Presentation : Measurement and verification of soil carbon sinks - Challenges and opportunities

Summary of Presentation :

Soil scientists have been measuring soil carbon changes as affected by land management practices for more than 100 years. The adoption of more sustainable land practices such as conservation tillage and extended crop rotations can result in soil carbon gains of 0.2 to 0.4 t/yr for 20 to 25 years. A pilot project has been initiated to determine the feasibility of measuring and verifying soil carbon changes over a 3-5 year period on representative prairie landscapes. Proposed national verification should include representative soil benchmark databases, carbon process models, land use information and various remote sensing applications. In addition to reducing emissions and enhancing sinks, soil C sequestration has the universal benefits of improved soil and water conservation, soil quality and productivity and consistent with the principles of sustainable land management.

Name of Presenter : Mr. Juri Truusa (Estonia)

Title of Presentation : Land-use, land-use change and forestry in Estonia : Overview

Summary of Presentation :

Estonia is a small (45 th.km^2) state with growing economy (average GDP + 4-6 % 1995 - 1998). Structure of landuse:- 67% forest, 26% arable land, 6% natural grassland. Volume of growing stock is almost doubled since 1980's (1997 - 295 mln m^3) annual increment more than 9 mln m^3 yearly, gross felling is rised from 1.3 mln m^3 on the end of 80's to 5.6 mln m^3 on the end of 90's. Estonia's platform to Kyoto UNFCCC is in conjunction with the EU targets.

Name of Presenter: : Mr. Heikki Granholm (Finland)

Title of Presentation : Changes in forest and other woody biomass stocks.

Summary of Presentation :

The role of forests as carbon sinks and reservoirs can be best ensured through sustainable forest management:

(a) Through protection and enhancement of existing carbon stocks,
(b) Through establishment of new carbon stocks, and

(c) By encouraging the use of renewable biomass and wood-based products to fossil fuels and fossil fuel-based products.

In the presentation, changes in forest and other woody biomass stocks accounting was pu forward for further consideration. In order to make changes in forest and other woody bi stocks accounting sink an operational sink calculation method, a possibility of determini common discount factor in which total forest carbon stock change might be credited to c

A brief comparison of individual and detailed activity-based approach and the changes in and other woody biomass stocks accounting method.

Name of Presenter : Olafur Arnalds (Iceland)

Title of Presentation : Organic carbon sequestering by restoration of sever degraded areas in Iceland

Summary of Presentation :

1) Carbon in soils is very important in relation to the FCCC.
2) Excluding soil carbon as sink activity puts unfair bias on areas with favou conditions for tree growth.
3) Exceeding the soil component gives wrong picture of carbon balance of f systems (sometimes huge errors).
4) Icelandic research shows that carbon sequestration in relation to restoratio severely degraded areas can be quantified and verified.
5) Such additional activity provided incentives for actions important for sust development, and the goals of the CCD and the biodiversity conventions.
6) Iceland provided a special report on designated actions for sequestering c relation to restoration of severely degraded lands.

Name of Presenter : Mr. Lorenzo Ciccarese (Italy)

Title of Presentation : Human-induced activities related to the forest secto Italy and impact on carbon budget

Summary of Presentation :

A refinement in carbon budget evaluation under the IPCC methodology and its adaptatio incorporate new human-induced activities have remarkable effects on the carbon sink-so balance of Italy's forest sector. A more precise evaluation of carbon storage might bring the need to reconsider the role of the forest sector in a country level net carbon balance.

reconsideration of some human-induced activities will bring about a more complete economic recognition of the important positive functions of the forest resources.

Name of Presenter : Mr. Masahiro Amano (Japan)

Title of Presentation : Discussions on implications of the Kyoto Protocol, Article 3.4 in the Japan case.

Summary of Presentation :

There are several alternative definitions for the fundamental concepts relevant to the Land Use Change and Forestry Sector. This report is to discuss alternative definitions and their merits and demerits through the Japan case. The Kyoto Forest (ARD) in Japan will be a carbon source under the definition of ARD which is defined with land use changes, IPCC interpretation. On the other hand, the Kyoto Forest in Japan will be a carbon sink under the definition with land cover changes, FAO interpretation. Almost all forests are classified into managed forests in Japan. If the Article 3.4 may include managed forests as additional human induced activities, the amount of carbon sequestrated into Japanese Forest Sector will count for 10 times comparing to forests limited to ARD, Article 3.3 forests. But it is not fair to take account of all forests without regard to the difference of forest area per capita, because the amount of carbon gained by total forests is strongly related to the forest area per capita of each country.

Name of Presenter : Mr. Audun Rosland (Norway)

Title of Presentation : CO_2 sinks in Norway and methodologicai issues to additional human-induced activities

Summary of Presentation :

The IPCC Special Report on LUCF should be the main basis for decisions on definitions and rules on the inclusion of activities under both Article 3.3 and 3.4 of the Kyoto Protocol. Inclusion of new activities under Article 3.4 should give credit to countries that endeavour to maintain and support sustainable forest management and forest biodiversity.

For the second and subsequent commitment periods it is Norways general view that we should aim for a full carbon stock account, prerequisite that sufficient estimation methodology has been developed. An inclusion of full carbon stock account may necessitate new and more differentiated commitments for the Parties. For the first commitment period - however - it is important that harvesting and other forest management activities are limited to those forest areas defined under Article 3.3. (that is limited to "since 1990").

Activities that would change the net CO_2 sink in soil should be included, as long as the stock change can be measured in a verifiable way. However, guidelines and rules on activities related to soil carbon should take into account that the stock change processes are highly dependent on temperature, latitude, altitude and vegetation cover.

In Norway and in other countries in the Boreal forest area, the "Kyoto forest" as it is defined under Article 3.3., could be a carbon source rather than a sink, while the "real forest" is a large sink, for the case of Norway, even with an increasing yearly net sink. The last 10 years the total forest area in Norway has been a sink of 10-18 million tonnes of CO_2 every year. This is equivalent to about 40% of the total CO_2 emissions from fossil fuel etc. in Norway.

Estimations done in Norway show that the amount of carbon stored in wood products is significantly less than in forests, approximately 0.5 million tonnes per year. Storage in buildings is the most important carbon reservoir for wood products. The uncertainty of the estimates is larger than +/- 50%.

The "dead" carbon content in soil is probably approximately 5 times higher than in the "living" biomass in the forests. A very rough estimate of yearly accumulation in soil is 3 million tonnes of CO_2. (the uncertainty is probably one order of magnitude). Higher temperature could reduce the carbon content.

Fresh waters and estuaries also represent carbon sinks in Norway.

Name of Presenter : Mr. Aleksander Golob (Slovenia)

Title of Presentation : Influence of sustainable forest management on carbon storage in Slovenia

Summary of Presentation :

Long tradition of sustainable forestry and forest management planning (1771). Since the 19th century, forest area has risen from 36% to 55% today, growing stock has more than doubled. Forestry policy promotes close-to-nature forestry aiming at higher growing stock; shelterwood instead of clear-cutting.

Forest management planning in all forests since 1961 provide for reliable data concerning carbon storage in above-ground biomass (permanent sample plots).
Slovenia supports full accounting system. Some flexibility in methodology should be allowed provided that relevant documentation exists. Forest management practices should be taken into account for assessing changes in below-ground biomass pool.

Name of Presenter : Mr. Mats Olsson (Sweden)

Title of Presentation : Uncertainties in measurements of carbon stocks in forest soils - effects of silvicultural measures

Summary of Presentation :

The soil is actively contributing to the carbon fluxes and its inclusion in Article 3.3 and 3.4 is a logical and important step. It may presently be difficult in most cases to include soil carbon in a verifiable and transparent manner due to lack of precise instruments for measurements and follow-up. Any decision taken should however not exclude the possibilities of a future inclusion of soil carbon stocks. It is particularly important that soil carbon stocks are considered when forest management is expected to cause negative spill-over effects that counteract greenhouse gas mitigation.

Name of Presenter : Mr. Daniel Perruchoud (Switzerland)

Title of Presentation : Assessing regional changes of carbon stocks in forest soils.

Summary of Presentation :

Soil organic carbon (SOC) represents a substantial carbon sinks in naturally regrowing forests of Western Europe adding between 30-50% to the forest tree carbon sink at present.
Given the high SOC variability and the slow response of SOC to environmental changes, depletion or accretion of SOC is unlikely to be detected by conventional soil monitoring at regional scale.

Current SOC accumulation in European forests represent a transcend effect and will be reversed if litter inputs decrease in response to land-use change or if microbial respiration is enhanced in a warmer world.

Name of Presenter : Mr. Michael Jawson and Mr. Richard Birdsey (USA)

Title of Presentation : Article 3.4: Potential framework for land-use management activities

Summary of Presentation :

- Proposed a system of complete carbon accounting on all managed lands.

- Broadly defined management activities (e.g., cropland, grassland, forest land) including land-use, land cover and land management offer the greatest production flexibility while:

- counting sources and sinks associated with a wide range of practices.
- ensuring all production practices and lands are included.
- providing incentives for innovation.

- A system of research (basic, process studies and long-term field experiments), and inv
and databases and modelling (process driven) provides a repeatable, verifiable and
comprehensive accounting of changes in carbon stocks in the agricultural and forest poo

Annex III[1]

I. REPORT OF SUB-GROUP ON AGRICULTURE

After two expert presentations, the working group proceeded to explore the information necessary for the selection of additional activities under Article 3.4. It was considered useful if IPCC could evaluate the implications of selecting broadly defined activities versus narrowly defined activities for the issues listed below.

Priority issues

The group identified the following as priority issues SBSTA would need to have information on in order to make an informed decision on inclusion of additional activities:

What verifiable changes in carbon stocks and the exchanges of other GHG would result from the activity for each Party in Annex B? This would require estimation of rates of removals or emissions from the activity and the area potentially available for the activity.

Are the changes in carbon stocks human induced?

How permanent are the changes in carbon stocks?

What are the associated uncertainties?

Does the activity contribute to meeting the objective of other environmental agreements?

The IPCC Special Report will address all of these issues. Additional information from Parties will also be required, in particular on no. 1.

Other relevant issues

The group also considered following issues of relevance to this process. Some of these relate directly to the priority issues listed above. For many of these, information is needed on the availability of tools and methods for the determination of these aspects.

Data needs and availability

Data needed to select activities to be added under Article 3.4.
Data needed to report on an activity and to verify the changes in carbon stocks
What? Where? Level of detail? Major gaps?
Data on impacts on emissions of other GHG

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[1] The information in this annex was provided by the presenters. The text has not been edited by the secretariat.

Monitoring
- Methodology
- Transparency

Additionality
- Baseline determination

Attribution
- To human impact
  - Direct or indirect?
  - Since 1990 or pre-1990?
- To natural processes

Ancillary costs and benefits
- Biodiversity
- Environmental services
- Direct impacts on emission
- Desertification

Leakage
- Ensuring net benefits

Temporal dynamics of changes in carbon stocks
- Permanence
- Changes in rates with time (including changes in sign)

Economic factors and incentives
- Cost of implementation
- Cost of verification and reporting

Driving forces and motivations
- Leading to the implementation of the activity
- Leading to negative effects (such as land degradation)

Vulnerability to climate change

Information from IPCC and Parties

The group agreed that a unified format for the presentation of information on activities in the IPCC report would be useful. This exact format would be developed in consultation with the UNFCCC secretariat.

It was also agreed that it might be useful to request from Parties initial estimates of changes in carbon stocks resulting from activities and on the availability of data to underpin decisions by SBSTA.

II. REPORT OF SUB-GROUP I ON FORESTRY

OVERARCHING CONTEXT ISSUES

- Consistency with objectives of the FCCC
- 1st commitment period
  Framework - Gross/limited Net
  since 1990 (Kyoto Forest)
  changes in carbon stocks
- 2nd and subsequent commitment period
  Target framework may be different
  Since 1990 may not apply
  Consistency with move to more comprehensive accounting

"ACTIVITIES" KEPT IN MIND

- Changes in forests and other woody biomass stocks
- Forest Management Activities - some examples
  thinning
  changes in ?standing stock? due to changes in rotation length
  reduced impact logging
  activities that cause degradation

CRITERIA (details inside brackets are issues/questions felt to be relevant)

1. Consistency with the Kyoto Protocol including links within the Protocol.
   1st commitment period
   2nd and subsequent periods

(implications for target; expansion i.e. to future full accounting; permanence; anthropogenic vs human induced; transparency; clarity i.e. single clear definitions; co-benefits; risks i.e. fires, pests and diseases, severe storms, informal harvesting)

2. Based on sound science - inventory data, also social and economic science

(data availability, accuracy, verifiability; consistency with & availability of current methodologies; scale i.e. magnitude; scale independence i.e. local, regional, national, between countries; transparency; expansion i.e. to future full accounting; practicability; cost effectiveness including social costs; clarity i.e. single clear definitions; anthropogenic vs human induced; risks i.e. fires, pests and diseases, severe storms, informal harvesting)

3. Promote other environmental and social objectives

(scale independence i.e. local, regional, national, between countries; appropriate incentives i.e. positive not perverse; expansion i.e. to future full accounting; leakage; practicability; cost effectiveness including social costs; sink potential; consistency with other conventions CBD,CCD,RAMSAR; risks i.e. fires, pests and diseases, severe storms, informal harvesting)

4. Symmetry in the treatment of both sources and sinks
(appropriate incentives i.e. positive not perverse; expansion i.e. to future full accounting; transparency; links/interaction with 3.3 activities; leakage)

5. Promote objectives of the FCCC
(appropriate incentives i.e. positive not perverse; expansion i.e. to future full accounting; permane scale, i.e. magnitude; cost effectiveness including social costs; co-benefits; consistency with othe conventions CBD,CCD,RAMSAR)

PROCESS AND TIMING ISSUES

Short term
1st Commitment Period
COP 6 decisions
1st sentence of Article 3.4
IPCC Special Report
Necessary SBSTA parallel process
Demonstrable progress (Art 3.2) by 2005 - e.g. what necessary re Articles 5 & 7

Medium term
2nd Commitment Period
2005 or earlier - beginning negotiations
IPCC SR
IPCC TAR
Necessary SBSTA process

WHAT WOULD WE LIKE TO DO AT SBSTA 10?

- Policy and Procedural Issues
  - Compilation of submissions
  - Paper by the secretariat - way forward?
- Side bar workshops to discuss sinks issues further - i.e. move to next level of detail coming out of this workshop. (Also a desire for more a detailed workshop later, also in conjunction an IPCC lead authors meeting).
- Presentations on Key Issues identified in this and the Rome workshop - by Parties? - Expert
- More detailed verbal and written report from the IPCC, e.g. detailed Chapter Outlines

ISSUES RELATED TO THE IPCC SPECIAL REPORT

- Need for data - i.e., magnitude of sink for specific "activities"?
  - aggregate Annex B
  - country/region specific

- Clarity / clarification regarding "activities" is required
  - e.g. individual "human-induced" activities such as thinning from
  - changes in stocks in forests (regarded as an activity in IPCC Guidelines)

- Harvested wood products
  - if no, or minimal, more than Dakar report SBSTA needs to take up this issue as soon as possible.

III. REPORT OF SUB-GROUP II ON FORESTRY

METHODOLOGY		
Criteria	Forest Management	Natural Regeneration
Can "human-induced" be distinguished	Does it need to be "active" management?	Is abandonment "human induced"? Could it be driven by indirect policies?
Can terms be consistently defined	How is conservation/ preservation treated? Wood products? Below ground carbon?	Is used to define a regeneration practice and to define natural land use reversion from agriculture to forest. Is this covered in Article 3.3?
Uncertainties	Broader activity defn. will have lower uncertainty. Greater number of plots to assess trends. Above ground carbon better.	Lower confidence. Can natural regeneration be distinguished from planting?
Consistency with IPCC guidelines	Yes	Could be.
Data and methods availability	Generally available for Annex I countries. Not all. Methods not always comparable.	Depends on the country. Could be improved easily.
Since 1990	Does this require a change in management since 1990, or all forest management since 1990?	Can be determined from the age of the stand. Might be difficult in cases of natural succession.
Measurability	Yes. Could be compared with atmospheric measurements.	Yes. Lower confidence.
Research and development needs	Monitoring and data collection. Statistical design. Soil carbon. Wood products.	How useful is this activity as a sink.

CHARACTERISTICS		
Criteria	Forest Management	Natural Regeneration
Ease/clarity of definitions	Since 1990 could cause problems. All activities or just the changes since 1990.	All natural regeneration or just natural succession?
Symmetry	Captures sources and sinks	Primarily a sink. Depending on the baseline from which the activity is compared against.
Permanence and reversibility -- internal or external to system?	internal to forest management -- other land uses in or out?	Depends on if the comparable sources are added.
Potential for "perverse" incentives	Could exist if the commitment periods are not contiguous.	Could exist if the commitment periods are not contiguous.
Positive and negative externalities	Broad range of positive and potentially negative externalities. More positive.	Loss of agriculture lands. Increased biodiversity. Extension of forest area.
Leakage	broader category reduces leakage. Could exist if other land management activities are not included.	Narrower activity could result in greater leakage.
"lock-in of technology	No. Under a broad definition of forest management.	Includes a specific class of management/regeneration techniques
Incentives for good forest practices	General. Specific actions are not promoted.	Could be used to target specific actions to sequester carbon.
MAGNITUDE		
Criteria	Forest Management	Natural Regeneration
Applicable land base	Large	Smaller
Technical potential	Large	Smaller
Baselines (?)	Additional or all activities? Can baselines be calculated?	Additional or all activities? Can baselines be calculated. This could be difficult for natural regeneration.
National data	How will this affect national targets?	How will this affect national targets?

TIMING Criteria	Forest Management	Natural Regeneration
When do benefits accrue?	Intermediate stand management can produce benefits more quickly than planting	Natural regeneration produces carbon benefits more slowly than other more active management.
How long before system for assessment can be established?	Will depend on how the system is defined and the similarities with current national inventory systems.	Will depend on how the system is defined and the similarities with current national inventory systems.
Delay between investment and benefits	Yes	Yes

IV. REPORT OF SUB-GROUP III ON FORESTRY

Starting point:

- Selection of "human induced activities" as indicated by Article 3.4; and scope of definition
- Broad: ("activity") (forest management area)
  Narrow: ("practices") (thinning, felling, fertilize, drainage,...)
- Bound area for consideration by: "direct human induced" activity, and by "measurable and verifiable".

Goal:

- "Comprehensive C accounting and GHG response in forest sub sector".

Strategy:

- Decide on process of additional forest management practices (from Article 3.3)
  (Could be a series of decisions...).

Questions to be examined in decision making on additional activities:

Characterization of additional land based activities

1. State of knowledge and understanding of mechanisms (summary):
   - how do the processes work
   - dynamics of carbon pools and forest system

2. Amount of carbon involved: global, regional, national level.

Measuring carbon and other GHGs

1. Measurement and verification

2. Data availability

3. Cost of monitoring, and implications for data quality

4. Which carbon pools:
   - Data quality?
   - Data availability?
   - Which are key pools for carbon accounting
   - Soil depth and horizons

5. Information on models used which describe
   - Assess direct human impacts on C
   - Peer reviewed?
   - Documentation
   - In IPCC Special Report
   - In national reporting

6. Data:
   - Estimates measurable? Verifiable?
   - Models - link to data and activity
   - Reviewed
   - Transparency
   - IPCC identify potential to get data, and time data could be expected (first second?). Address capacity of Parties to provide data/estimates
   - "Best practices guidance" for carbon estimation, selection and use of met

Implication of carbon storage

1. Lifetimes of carbon pools: comparability with emissions of other GHGs and sec
   - Risk and permanence
   - Different timeframes and lifetimes for carbon pools and carbon systems
   - Managing risk
   - Risk: example:
     - Natural (variability, El nino, global change)
     - Social and institutional
     - Technical

2. Implications for Sustainable development, including:
   - Biodiversity
   - Desertification
   - Sustainable forest management
   - Soil and water quality

3. Impact on other GHGs
   - Spillover effects.

Future developments and needs

1. Further research needs

2. Further data needs

3. SBSTA request for:
   - Additional data in 3rd National communications to supplement analysis in

- Parties to begin monitoring for future needs.

Policy issues/areas

1. How to distinguish between activities before and after 1990?
2. Human induced vs. natural activity determination
3. Does "direct human induced" refer to the C or to the activity on the land?
4. Direct vs. indirect effect? Attribution of C stock changes
5. Period before 2008? Event points?
6. Treatment of fires: set or natural, on managed or unmanaged land?
7. Similarly, insects and treat or not
8. Tons and targets?
9. Gross/net vs. net/net.